

**U.S. Patent Application For**

**DISPLAY FOR AN ELECTRONIC DEVICE**

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## DISPLAY FOR AN ELECTRONIC DEVICE

### BACKGROUND OF THE INVENTION

[0001] A variety of displays are utilized with electronic devices, such as portable computers, to display information to an individual using the device. A graphical user interface “GUI” allows the individual to interact with the device through an input device, such as a keyboard or mouse. Other displays allow the individual to interact with the display itself through the use of touch screens, including screens designed to permit written instructions via a pointer. However, such screens are susceptible to scratching and other wear that limits the useful life of the display. Additionally, such devices utilize a housing in which the display screen is mounted. The housing tends to inhibit movement of the individual’s hand across the screen. The interfering housing can limit the ability of the individual to comfortably interact with the display by, for example, writing instructions or other inputs onto the screen.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Certain embodiments of the invention will hereafter be described with reference to the accompanying drawings, wherein like reference numerals denote like elements, and:

[0003] Figure 1 is a perspective view of an electronic device, according to an embodiment of the present invention;

[0004] Figure 2 is a top view of the electronic device of Figure 1;

[0005] Figure 3 is a perspective view of the device illustrated in Figure 1 detached from an embodiment of a keyboard;

**[0006]** Figure 4 is an exploded cross-sectional view taken generally along line 4-4 of Figure 1;

**[0007]** Figure 5 is a top view of an embodiment of a pad utilized in the display illustrated in Figure 1; and

**[0008]** Figure 6 is a bottom view of the pad illustrated in Figure 6.

### **DETAILED DESCRIPTION**

**[0009]** Referring generally to Figure 1, an electronic device 10 is illustrated according to an embodiment of the present invention. The electronic device 10 may be a computer-based device, such as a portable computer.

**[0010]** In one embodiment, the electronic device 10 comprises a personal computer 12 having an internal controller 14, such as a microprocessor. A housing 16 encloses the controller 14 electrically coupled to a display for displaying information and/or interacting with a user. The housing 16 has a perimeter edge 18 and a base surface 19. A display surface 20 extends outwardly to the perimeter edge 18. The base surface 19 is generally opposite the display surface 20 and may be parallel with the display surface 20. In the embodiment illustrated, the perimeter edge 18 defines a generally rectangular shape, and the display surface 20 is generally rectangular. However, the perimeter edge 18 and the display surface 20 may have forms in other shapes. As illustrated, the display surface 20 extends uninterrupted from one perimeter edge 18 to another. For example, the display surface 20 may be disposed along a plane extending through the perimeter edge 18. A top surface of the display surface 20 abuts the perimeter edge 18 to form an uninterrupted, smooth transition between the display surface 20 and the perimeter edge 18, so that no bumps, ridges, indentations, or the like exist along the junction below the display surface 20 and the perimeter edge 18.

**[0011]** In one embodiment, the display surface 20 is defined by a display panel, such as a glass panel 22 located within a surrounding bezel 24. The glass panel 22 is positioned flush with the top of the bezel 24 to provide a smooth transition from the glass panel 22 to the bezel 24. In other words, an individual interacting with the electronic device 10 via the

display surface 20 is able to write or draw against the glass panel 22 without encountering any obstruction as the individual moves a hand or instrument across the glass panel 22 and the bezel 24. The use of glass protects against scratching and other types of wear when a pen or other pointer mechanism, e.g. a pointer mechanism 26, is used on the display surface 20. It should be noted that the electronic device 10 may utilize other input devices, such as a detachable keyboard 28.

[0012] With additional reference to Figure 2, one example of the personal computer 12 is a portable computer, such as a tablet personal computer (PC). The tablet PC has a portable, easy-to-grasp form factor with an integral display and internal controller.

[0013] The pointer mechanism 26, by way of example, may be in the form of a battery powered digitizer pin. In this embodiment, the pointer mechanism 26 is designed to interact with various digitizer activated buttons 30, 32 and 34. As illustrated, the pointer mechanism 26 comprises a tip 36 and one or more buttons, such as a select button 38, to facilitate user interaction with the digitizer-activated buttons 30, 32 and 34.

[0014] The pointer mechanism 26 may be designed to interact with a digitizer panel 40 disposed below the display surface 20 within the housing 16 (see also Figure 4). The digitizer panel 40 may be disposed below the glass panel 22 with, for example, a small gap between the digitizer panel 40 and the glass panel 22.

[0015] In the embodiment illustrated, the pointer mechanism 26 interacts with the digitizer panel 40 and an associated graphical user interface (GUI) 41 for coordination, selection, writing and other user-interaction via information provided through the display surface 20.

The pointer mechanism 26 also may be utilized with a variety of buttons/icons 30, 32 and 34 to perform various predetermined functions. Furthermore, the digitizer panel 40 and the pointer mechanism 26 may comprise a variety of suitable technologies for interaction, such as electron field, ultrasonic, radio frequency, infrared, electrostatic, electromagnetic and other existing, emerging or future technologies. The digitizer panel 40 and the pointer mechanism 26 may operate by one-way or two-way signal transmissions, in either direction, between the digitizer panel 40 and the pointer mechanism 16.

[0016] Depending on the type and application of the electronic device 10, a variety of other input mechanisms may be utilized. For example, a plurality of physical buttons 42, 44, 46, 48 and 50 may be mounted along housing 16. As illustrated in Figure 2, the buttons may be located at a desired position along the perimeter edge 18. Examples of functional buttons comprise a jog dial, an SEC key, a tab key, a CRL-ALT-DEL key combination, a RETURN key, a mouse key or other standard or specialized keys. These are just a few examples of the types of functionality and the physical form factors available for the electronic device 10.

[0017] Referring also to Figure 3, the input mechanisms may comprise a detachable keyboard 28. In this embodiment, the detachable keyboard 28 comprises one or more attachment prongs 52 that are slidably received through the perimeter edge 18. The attachment prongs 52 are mounted to a pivot 54 that permits the pivoting of the housing 16 and the display surface 20 with respect to the detachable keyboard 28. In this manner, the display surface 20 may be positioned at a variety of orientations with respect to the detachable keyboard 28 including a fully folded position, as illustrated in Figure 1, in which the display surface 20 remains available for viewing and interaction.

[0018] With further reference to Figure 3, the housing 16 may be designed to accommodate other features, such as a storage recess 56 for receiving the pointer mechanism 26.

Additionally, a power button 58 may be mounted along the perimeter edge 18. Each of these features has been described to provide examples of various functions and features that can be incorporated into the electronic device 10, and should not be construed as limiting.

[0019] Referring generally to Figure 4, the glass panel 22 is mounted to the bezel 24. The bezel 24 may comprise an external section 60 and an underlying support section 62. The bezel external section 60 is sized to enable a flush mounting with the glass panel 22, and an underlying support section 62 is disposed to support the glass panel 22 along its perimeter. As illustrated, a pad 64 (see also Figures 5 and 6) is disposed between the glass panel 22 and the underlying support section 62. The dimensions of the external sections 60 and the pad 64 are selected such that when the glass panel 22 is mounted on the underlying support section 62, the outer surface of the glass panel 22 is flush with the external surface of the bezel external section 60. In other words, a smooth display surface 20, free of ridges or other interfering obstacles, is enabled by the smooth transition between the glass panel 22 and the external section 60.

[0020] The glass panel 22 may be attached to the bezel 24 by a variety of mechanisms, including fasteners and adhesives. In one embodiment, however, the glass panel 22 is attached to the underlying support section 62 by an adhesive 66 applied to the pad 64. For example, the adhesive 66 may be applied between the glass panel 22 and a top surface 67 of the pad 64, as illustrated in Figure 5. Additionally, the adhesive 66 may be applied between the underlying support section 62 and a bottom surface 68 of the pad 64, as illustrated in Figure 6. When the glass panel 22, the pad 64, and the underlying support section 62 are

pressed together, the adhesive 66 securely holds the glass panel 22 in place with respect to the housing 16. The positioning of the pad 64 also helps absorb shock and vibration in the event the device 10 is dropped or otherwise jarred.

**[0021]** Depending on the specific design of the housing 16, the panel 22, and the digitizer panel 40, the adhesive 66 is not necessarily applied along the entire top and/or bottom surface of the pad 64. For example, a region 69 along the bottom surface of the pad 64 may remain free from adhesive. The region 68 serves as a seal between the digitizer panel 40 and the glass panel 22 to prevent dust or other debris from moving between the panel 22 and the digitizer panel 40. Also, the pad 64 potentially may be formed from a variety of materials, but one embodiment of the pad 64 utilizes a sheet of foam material.

**[0022]** While the invention may be susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and described in detail herein. However, it should be understood that the invention is not intended to be limited to the particular forms disclosed.